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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,582	11/21/2003	Han-Ming Yuan	YUAN3007/EM	8553

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BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314

EXAMINER

PHAM, THANHHA S

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/717,582

Applicant(s)

YUAN ET AL.

Examiner

Thanhha Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to Applicant's Amendment dated 04/28/2005.

Oath/Declaration

1. Oath/Declaration filed on 11/21/2003 has been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1-5 and 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

- With respect to claim 1,

lines 7-9, "forming the contact hole by removing said photoreist and said nitride layer" renders the claim indefinite. It is not clear where the contact hole is formed.

It is not clear how the contact hole is formed by removing said photoresist and removing said nitride (if none of said photoresist and said nitride exists, where the contact hole is located). The claim is rejected as being incomplete for omitting essential steps, such omission amounting to a gap between the steps.

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See MPEP § 2172.01. The omitted steps are removing portions of the plurality of proper operation layers.

► With respect to claim 5,

line 36, "before the removing step" renders the claim indefinite. It is not clear that "the removing step" refers to which step of the process – the step of removing said nitride layer OR the step of removing said photoresist (see claim 1 for details).

► With respect to claim 9,

lines 8-9, "the respective contact holes" lacking antecedent basis should be changed into "the gate contact hole and the non-gate contact hole" to clarify scope of claim

line 10, "the respective operation layers" lacking antecedent basis should be changed to "the operation layers"

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al [US 6,472,306].

► With respect to claim 1, Lee et al (figs. 9-16 and cols. 1-6) discloses the claimed contact hole forming method comprising steps of:

providing a substrate (100, fig 9);

forming a plurality of proper operation layers (102/104/106/108, fig 9) as required on said substrate;

forming a nitride layer (110, fig 9, col 5 lines 26-31) on an uppermost layer (108) of said operation layers;

forming a photoresist (112, fig 10, col 5 lines 33-36) on said nitride layer to define a position to be formed into a contact hole;

forming the contact hole in the proper operation layers by removing portions of said nitride layer and said operation layers (fig 12);

removing said photoresist (fig 12); and

removing said nitride layer (110, figs 13-14).

► With respect to claim 5, Lee et al (fig 13, col. 5 lines 63-67 and col 6 lines 1-16) discloses using photoresist (126) to protect portions not to be eroded in said step of removing said nitride layer (figs 13-14) before removing said nitride layer (110, figs 13-14).

4. Claims 1-4 and 10-12, as being understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Hwang et al [US 2004/0038524].

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► With respect to claim 1, Hwang et al (figs. 2's and text [0001]-[0083]) discloses the claimed contact hole forming method comprising steps of:

providing a substrate (100, fig 2A);

forming a plurality of proper operation layers (102/104/106/108/110/112, fig 2B) as required on said substrate;

forming a nitride layer (114, fig 2C, text [0036]) on an uppermost layer (112) of said operation layers;

forming a photoresist (116, fig 2D, text [0037]) on said nitride layer (114) to define a position to be formed into a contact hole;

forming the contact hole in the proper operation layers by removing portions of said nitride layer and said operation layers (figs 2D-2H);

removing said photoresist (116, fig 2H); and

removing said nitride layer (114a, figs 2H-2I, text [0044]-[0045]).

► With respect to claim 2, Hwang et al (text [0044]-[0045]) discloses the step of removing said nitride layer is performed by etching, and a corresponding portion of one of said operation layers (108) not removed in the step of forming the contact hole is removed simultaneously.

► With respect to claim 3, Hwang et al discloses said one of said operation layers (108), of which the corresponding is not removed in the step of forming the contact hole, is a nitride layer.

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► With respect to claim 3, Hwang et al discloses said one of said operation layers (108), of which the corresponding is not removed in the step of forming the contact hole, is a cap nitride layer of a gate electrode (107).

► With respect to claim 10-12, Hwang et al discloses the step of forming a plurality of proper operation layers comprising forming a conducting layer (104) of polysilicon; forming a gate metal (106) on said conducting layer; forming a cap nitride (108) on said gate metal; forming an oxide layer (110) on said cap nitride; and forming a thin conductive layer (112) of a thin polysilicon on said oxide layer; and wherein the step of forming a contact hole comprising removing portions of the nitride layer, thin conductive layer and oxide layer corresponding to the position to be formed into the contact hole before removing the photoresist; and removing a portion of said cap nitride corresponding to the position to be formed into the contact hole after the photoresist is removed so as to form a gate contact hole.

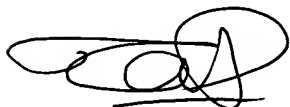
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thanhha Pham', with a large loop at the end.

Thanhha Pham
Patent Examiner
Patent Examining Group 2800